APPENDIX B: LISTED, PROPOSED, and CANDIDATE SPECIES & SPECIES OF CONCERN

LISTED SPECIES

Birds		
Bald eagle	*Haliaeetus leucocephalus*	*T*
Northern spotted owl	*Strix occidentalis caurina*	*T*, CH
Fish		
Shortnose sucker	*Chasmistes brevirostris*	E, PCH
Lost River sucker	*Deltistes luxatus*	*E*, PCH
Bull trout (Klamath River and Columbia River population segments)	*Salvelinus confluentus*	T
Plants		
Applegate's milk vetch	*Astragalus applegatei*	*E*

PROPOSED SPECIES

Mammals		
Canada lynx	*Lynx canadensis*	PT

CANDIDATE SPECIES

Amphibians		
Oregon spotted frog	*Rana pretiosa*	C

SPECIES OF CONCERN

Mammals	
White-footed vole	*Arborimus albipes*
Pygmy rabbit	*Brachylagus idahoensis*
North American lynx	*Felis lynx canadensis*
California wolverine	*Gulo gulo luteus*
Pacific fisher	*Martes pennanti pacifica*
Long-eared myotis (bat)	*Myotis evotis*
Fringed myotis (bat)	*Myotis thysanodes*
Long-legged myotis (bat)	*Myotis volans*
Yuma myotis (bat)	*Myotis yumanensis*
Pale western big-eared bat	*Plecotus townsendii pallescens*
Pacific western big-eared bat	*Plecotus townsendii townsendii*
Birds	
Northern goshawk	*Accipiter gentilis*
Tricolored blackbird	*Agelaius tricolor*
Western burrowing owl	*Athene cunicularia hypugea*
Western sage grouse	*Centrocercus urophasianus phaios*
Black tern	*Chlidonias niger*
Harlequin duck	*Histrionicus histrionicus*
Western least bittern	*Ixobrychus exilis hesperis*
White-faced ibis	*Plegadis chihi*
Columbian sharptailed grouse	*Tympanuchus phasianellus columbianus*
Amphibians and Reptiles	
Tailed frog	*Ascaphus truei*
Northwestern pond turtle	*Clemmys marmorata marmorata*
Northern red-legged frog	*Rana aurora aurora*
Foothill yellow-legged frog	*Rana boylii*

Cascades frog	*Rana cascadae*
Northern sagebrush lizard	*Sceloporus graciosus graciosus*

Fish

Klamath largescale sucker	*Catostomus snyderi*
Slender sculpin	*Cottus tenuis*
Pacific lamprey	*Lampetra tridentata*
Interior redband trout	*Oncorhynchus mykiss gibbsi*

Invertebrates

California floater (mussel)	*Anodonta californiensis*
Cascades apatanian caddisfly	*Apatania (Radema) tavala*
Cockerell's striated disc (snail)	*Discus shimeki cockerelli*
Schuh's homoplectran caddisfly	*Homoplectra schuhi*
Peaclam	*Pisidium ultramontanum*
Mardon skipper (butterfly)	*Polites mardon*

Plants

Crater Lake rock cress	*Arabis suffrutescens var. horizontalis*
Peck's milk-vetch	*Astragalus peckii*
Pumice grape-fern	*Botrychium pumicola*
Greene's mariposa-lily	*Calochortus greenei*
Long-bearded mariposa-lil	*Calochortus longebarbatus* var. *longebarbatus*
Green-tinged paintbrush	*Castilleja chlorotica*
Mount Mazama collomia	*Collomia mazama*
Prostrate buckwheat	*Erigonum prociduum*
Bellinger's meadowfoam	*Limnanthes floccosa* ssp. *bellingeriana*
Pygmy monkeyflower	*Mimulus pygmaeus*
Blue-leaved penstemon	*Penstemon glaucinus*
Red-root yampah	*Perideridia erythrorhiza*
Columbia cress	*Rorippa columbiae*

Key to Federal Threatened and Endangered Species and Species of Concern Lists

(E)--Endangered, (T)--Threatened (P)--Proposed (C)--Candidate,
(CH)--Critical Habitat (PCH)--Proposed Critical Habitat (PT)--Proposed Threatened
(PE)--Proposed Endangered

List compiled October 1999

APPENDIX C: Standards & Guidelines:

These Standards And Guidelines (S & G's) are designed to reduce adverse impacts to fish, wildlife, and plant species and their critical habitats. Appropriate S & G's must be executed by all project coordinators. S & G's are listed by main project categories, but in practice overlaps do exist among the categories. Individual S & G's are subject to becoming more stringent or additional S & G's may be instituted if restoration activities are changed.

General S & G's for all Project Categories:

1. Follow all terms and conditions in regulatory permits and other official project authorizations to eliminate or reduce adverse impacts to any endangered, threatened, or sensitive species or their critical habitats.

2. Significant modifications to an approved work plan must be reviewed and approved by appropriate agency personnel and the landowner(s) before the work can be carried out or continued.

3. Minimize or avoid obstructing fish passage during construction of restoration projects.

4. Use existing roadways or travel paths for access to project sites, wherever possible.

5. Avoid excessive soil disturbances or compaction of soils, especially on steep or unstable slopes.

6. Federal and state regulations regarding the storage, maintenance, and refueling of equipment and machinery will be followed. Necessary precautions for preventing spills of hazardous materials will be instituted.

7. In project areas requiring revegetation, native vegetation will be utilized to the extent possible.
8. Sources of materials used in restoration projects (including, but not limited to, boulders, rocks, wood and vegetation) will be acquired from appropriate and authorized sources.

9. Hazardous materials would be used, stored and removed in accordance with federal, state, and local rules and regulations. Appropriate precautions would be taken to prevent spills, and necessary safety equipment would be readily available at the work site.

10. Sedimentation and erosion controls must be implemented on project sites where restoration activities will result in soil and/or slope disturbances, to the extent possible.

11. Excess excavated materials removed during the completion of a restoration activity must be disposed of properly and/or stabilized to eliminate future environmental problems. Sedimentation and erosion controls must be implemented to prevent adverse impacts to down

slope habitats.

12. Materials containing toxic preservatives must not be placed in streams, riparian zones, or wetlands. Wet concrete or runoff from cleaning tools that have wet concrete slurry or lye dust must never enter aquatic habitats. Runoff control measures must be employed, such as hay bales and silt fences, until the risk of aquatic contamination has ended.

13. Monitoring is required during project implementation and for at least one year following project completion to ensure that restoration activities implemented at individual project sites are functioning as intended and do not create unintended consequences to fish, wildlife, and plant species and their critical habitats or adversely impact human health and safety. Corrective actions, as appropriate, must be taken for potential or actual problems.

Instream Habitat Restoration Projects:

1. Instream restoration activities must occur during appropriate times as determined by appropriate state and federal laws and regulations.

2. Large woody debris and boulders used for instream structures need to be appropriately sized, anchored, and/or placed to eliminate or reduce the movement of these materials during high flow events. Size standards must be determined by hydrologists, biologists, or other qualified professionals and should be based on individual stream reaches and their associated seasonal discharge rates. Durable wood and rock materials should be used for instream structures.

3. Installed instream or streambank structures altering hydrologic flow regimes must not impact adjacent or downstream properties or manmade structures.

4. Access of heavy equipment to the streambeds and streambanks must be limited as much as possible. Instream construction activities must be minimized to reduce sedimentation rates, channel instability, and aquatic habitat impacts.

5. Soil and/or slope disturbances along stream channels should be eliminated or reduced wherever possible. Undisturbed vegetated buffer zones must be retained along stream channels to reduce sedimentation rates, channel instability, and aquatic habitat impacts.

Upland/Forest Restoration Projects:

1. Restoration activities that require prescribed burning of slash material or invasive vegetation must be planned and managed to maximize the benefits and reduce the detrimental effects of burns. Slash control and disposal must also be completed in a way that reduces the occurrence of debris from entering stream channels. Reduce the potential for very hot burns to conserve litter layers and eliminate or reduce the development of hydrophobic soil conditions. Plans for rapid site revegetation would be made to prevent erosion and gullying. Fire suppression equipment must always be located at the immediate project site during

prescribed burnings.

2. Retain or develop snags on project sites for cavity dependent wildlife species whenever possible.

3. Silvicultural activities (e.g. thinning and harvesting, including juniper projects) should be limited or restricted on steep slopes and highly erodible soils to prevent accelerated soil erosion and increased sedimentation rates. Tree falling should be done in an appropriate manner to avoid damage to surrounding vegetation and soils. Employ the proper yarding technique on project sites to eliminate or reduce soil disturbances and compaction of soils

Road Projects

1. Abandoned and decommissioned roadways should be revegetated if necessary. Compacted road surfaces would be tilled to promote vegetation establishment and growth. Ensure that drainage patterns on these roadways will not result in increased sedimentation rates or erosion to down slope habitats. Drainage improvements should be constructed and stabilized before the rainy season. Install water energy dissipators (e.g., water bars and rolling dips) along roadways and on all cross drain outfalls. Do not sidecast excavated road materials, and avoid accumulating or spreading these materials in upland draws, depressions, intermittent streams, and springs. Road entrances closed by tanking or ditching must have the excavated/ disturbed areas stabilized as soon as possible.

Riparian/Wetland Projects

1. Fence designs (e.g., wire type and wire spacing) and installations should not restrict the movement of wildlife species; limit the use of woven wire fences whenever possible.

2. Livestock crossings and off-channel livestock watering facilities must not be located in areas where compaction and/or damage may occur to sensitive soils, slopes, or vegetation due to congregating livestock. Livestock fords must be appropriately stabilized.

Fish Passage Improvement Projects:

1. The dimensions, slopes, jump heights, water depths, and seasonal flows in fishways must be adequate to pass the intended fish species and life stages at critical migration periods. Provide fish resting areas, as necessary, within the fishways, and maintain appropriate entrance flows to attract fish. Restrict fish access to inappropriate areas to prevent fish mortality.

2. Culverts and bridges, whether for livestock or vehicle access, must be sized to pass at least a normal seasonal high flow and designed to provide unobstructed fish passage at all times. Bridge abutments must be designed and installed in a way that does not alter stream flows or channel stability. Abutments should be properly protected (e.g., rock armored) to prevent future scouring actions and erosion hazards. Bridge designs and installations must conform to

all federal and state standards.

3. Installed culverts should be aligned to stream flows and positioned at or below stream grades. Culvert inlets and outfalls should be properly protected (e.g., rock armored) to prevent future scouring actions and erosion hazards. Use appropriate culvert lengths and install culverts at proper slopes (less than 1% slope gradient) to aid fish passage. Install baffles inside culverts to reduce flow velocities, if necessary. Open-bottom and arch culverts are the preferred culvert types to be used if existing culverts are to be replaced. A single large culvert is preferred over using several smaller culverts at individual stream crossings.

4. Develop maintenance schedules for culvert and bridge installations to ensure they remain in proper functioning condition. Install trash/debris racks, as necessary, to prevent blockage or damage to these structures. These racks must be installed and maintained in such as manner that fish are easily able to pass through them at any time.

5. All fish screening projects must be consistent with the state and federal guidelines.

APPENDIX D: Description of Restoration Activities and Analysis of Impacts

This table is intended as a guideline to restoration activities. Specific projects may utilize modifications and combinations of these project types.

Restoration Activity	Activity Description	Impact Analysis
Riparian Projects: 1. Fencing for livestock management --Streambank &/or cross-pasture fencing for livestock exclusion &/or grazing management. --Livestock stream crossings. 2. Alternative watering sources for livestock.	1. Installation of fences and watering facilities may eliminate or reduce livestock impacts to streambanks and riparian/wetland vegetation. Fence design would attempt to minimize affects of livestock concentration. Fences may be installed by hand and/or with mechanical augers/post pounders. Site preparations may involve the removal of vegetation along proposed fence lines; vegetation removal may be done by manual, mechanical, prescribed fire, and/or chemical means. Livestock stream crossings would be designed to minimize impacts to streambanks by livestock, usually utilizing rock or other hard material along streambank slopes. Crossing installations may also consist of appropriately fenced and armored streambank sections. 2. Watering facilities would be used to replace access by livestock to streamside watering sources where trampling and denuding of vegetation has occurred. Facilities would be installed in pastures next to streams and would consist of various pumping systems and water storage facilities. Either above ground or underground piping may be installed between watering devices and water sources.	1 & 2. Construction of fences, crossings and alternative watering sources may cause temporary decreases in water quality and may impact riparian/wetland vegetation. However, native vegetative and stabilization techniques would eliminate or reduce these conditions. Fences would protect riparian vegetation once established on streambanks (see #4 below). Watering facilities and livestock crossings would eliminate or reduce the need of direct livestock access to specific stream reaches, thus preventing further aquatic degradations.
3. Non-native plant removal/control	3. Non-native vegetation may be removed as necessary. Non-natives would be removed utilizing hand and mechanical tools, as well as chemical means as necessary.	3. Short term disturbances may occur. Temporary removal of cover and habitat would occur until native species become re-established.

4. Native plant establishment/ diversification.	4. Riparian/wetland buffer zones between streambanks and fence lines would be planted with native shrubs and trees where natural vegetation is not expected to occur in the short-term. Cuttings, transplants, and seeding may be utilized to re-establish vegetation.	4. Short term disturbance may occur during revegetation activities. Reestablishment of the native plant community would provide streambank stabilization, sediment retention/ stabilization, stream shading, nutrient production, wildlife habitats, and provide future sources of large woody debris.
5. Erosion control.	5. Natural stabilization materials (e.g., vegetation, boulders, rip-rap, woody debris, and fiber matting) would be installed to redirect or reduce stream flows to eliminate or reduce streambank erosion. Streambank slopes may be graded back to a n appropriate slope ratio to eliminate or reduce bank erosion and to ensure that structures and techniques would function properly. The extent of areas impacted by structures/techniques would depend on the degree of unstable banks. Structures would be placed and appropriately anchored within the toe and bank zones of stream channels and may provide cover for fish and aquatic wildlife species.	5. Installation of erosion control structures may cause temporary decreases in water quality (sedimentation and turbidity) and may impact riparian/wetland vegetation. However, follow-up native vegetative plantings and stabilization structures/ techniques would eliminate or reduce these conditions.
6. Wildlife habitat improvements	6. To enhance terrestrial and aquatic habitats holistically, various habitat components and structures would be installed or developed. These may include, but are not limited to, bat roosting/breeding structures, avian nest boxes, turtle basking logs, hardwood snags, brush/cover piles, nesting islands and berms, large downed woody debris, and raptor perches.	6. The installation of fish and wildlife structures may be part of instream, riparian/wetland, fish passage, and/or upland restoration activities and should not cause additional impacts to terrestrial and aquatic habitats. These improvements would provide extended benefits to a variety of fish and wildlife species.
Wetland Projects: 1. Fencing for livestock management.	See Riparian #1 for discussion of fencing projects.	See Riparian #1 for discussion of fencing projects.

2. Wetland restoration & enhancement.	2. Restoration, enhancement, creation and/or management projects would improve the wide array of wetland functions that are important for the overall health of any watershed. Wetland activities may involve, but are not limited to, the excavation and removal of fill materials (note: hydric soils, if present, would not be removed during fill removals), development of appropriate berms/impoundments with or without the installation of water control structures, planting of native wetland vegetation, plugging and/or removing drain tiles in agricultural fields, excavating pools and ponds, and de-leveling areas that have been laser leveled. Structures would be used for short-term establishment of natural processes and would only be used for long-term solutions if they are self-sustaining. Various types of wetland habitats and hydrologic regimes may be restored or created under these restoration activities. Hydric soils may be retrieved and stockpiled from other sites with necessary permits and used for the reestablishment or creation of wetlands.	2. As with any activity involving extensive earth disturbances, there would be a temporary decrease in water quality caused by increased sediment loading, but follow-up native vegetative plantings and stabilization structures/techniques would eliminate or reduce this condition. Excess fill materials removed during the completion of the above activities would be deposited in appropriate upland areas and stabilized to eliminate future sediment loading in down slope habitats.
3. Wildlife habitat improvements	3. See Riparian #7.	3. See Riparian #7.
In-stream Projects 1. Habitat complexity & diversity improvements. 2. Coarse woody debris & boulder supplementation. (Flosi and Reynolds 1994, Seehorn 1992)	1. Installations would consist of instream structures designed with large woody debris and/or boulder materials. Placements would mimic the natural structural complexity & diversity of aquatic systems, create needed spawning and rearing habitats for fish and aquatic wildlife species, and restore former hydrologic regimes. Structures would be used for short-term establishment of natural processes and would only be used for long-term solutions if they are self-sustaining. 2. Installations of wood and/or boulder instream structures would attempt to restore the former natural hydrologic functions in riparian and wetland habitats by the deflection of stream flows into adjoining floodplain areas. Flow deflections would improve and promote natural vegetation composition and diversity, decrease flow velocities, and increase water storage and recharge rates.	1 & 2. These types of installations may cause temporary decreases in water quality through increased sedimentation and turbidity and may impact riparian/wetland vegetation during structure placement. However, follow-up native vegetative plantings and bank stabilization structures/techniques would eliminate or reduce these conditions. Excess fill materials removed during the completion of the above activities would be deposited in appropriate upland areas and stabilized to eliminate future sediment loading in down slope habitats. The realization that improperly installed structures may cause adverse impacts to streams and streambanks are known and documented.

3. Hyrologic regime improvements.	3. To increase rearing habitats, side channels may be modified by opening or improving stream flows through these areas. The natural channel diversity and complexity would be restored by modifying hydrologic regimes and installing instream structures. In addition, the excavation and removal of channel and bank sediments would improve instream habitat characteristics and increase the hydrologic capacity of streams. Off-channel refuge areas (e.g., alcoves, backwaters, sloughs) would be developed to provide resting areas for aquatic species during high stream flow events. Instream structures may be installed, as necessary, to reduce flow velocities and provide appropriate protective cover. Reshaping of ditched/straightened stream channels, abandoning and/or plugging straightened reaches, and/or relocation of streams to historic channels may be carried out.	All of these would cause temporary decreases in water quality through increases in sedimentation and turbidity, and would impact riparian/wetland vegetation through removal. However, follow-up native vegetative plantings and bank stabilization structures/techniques would eliminate or reduce these conditions. These improvements would help decrease flood potential, increase water storage and recharge capabilities, and trap sediments. Streams would regain their sinuosity which decreases the flow rate and allows for the development of riparian and associated wetland areas and instream habitat complexity.
4. Artificial barrier removal, modification, & creation.	4. Natural & man-made impoundments have resulted in fish passage barriers on rivers and streams and in the loss of riparian/wetland vegetation, habitat loss, instream structural complexity and diversity, increased sediment loading, and de-stabilization of streambanks. Barriers may be removed entirely, or modified to improve fish passage, water quality, and habitat characteristics. Barriers may be lowered, excavated, bypassed, or removed via the most appropriate method. Barriers may be desirable either as temporary structures to minimize sedimentation and safeguard fish during construction projects or as permanent structures to protect stream reaches from non-native &/or harmful species. Gravel berms, log and rock barriers, and concrete dams are examples of structure which may be constructed.	4. Short term disturbance to water quality may result from construction activities. The modification & removal of barriers would provide extended benefits to resident fish species by improving passage, aquatic habitats, and water quality.
5. Fish screen installation.	5. Fish screens may be installed in dikes, dams and canals in order to prevent access to fish species. These may be used to exclude protected species from areas where they may become trapped during draw downs or injured by pumps, strains and other installations. Screens may also be utilized to exclude predator fish species from critical habitat of protected species. Fish screens would conform to relevant federal and state rules and guidelines.	5. Short-term adverse impacts may occur during construction. Protected fish species would benefit from exclusion from potentially harmful areas and the exclusion of predator species.

6. Non-native fish removal.	6. Populations of non-native fish species (such as brook trout) may be eradicated to prevent competition and cross-breeding with special status species (i.e. bull trout). Eradication efforts would be conducted in such a manner as to minimize impacts to desired species. Projects would be designed to prevent non-natives from becoming re-established in treated areas. Traps, electroshocking and approved chemical treatments (such as antimycin) would be used to remove non-native fish.	6. Short-term disturbance would result from project work. Electroshocking & chemicals are non-selective and may result in incidental removal of native fish, inver-tibrates, & amphibians. Removal of non-natives would decrease predation, competition and hybridization with natives.
Upland Projects 1. Re-establishment of historic contours.	1. Road cuts along slopes would be removed. Side cast slope materials would be pulled back and fill placed along slopes to mimic original topography of the site. Appropriate drainage structure would be installed to dissipate flows & minimize sediment.	1. Short-term disturbance would result from project work. Recontouring projects would help restore hydrologic function and minimize sediment movement. Restoring contours would also minimize hazards of landslides and slumps along slopes.
2. Silvicultural treatments, including: -Prescribed burning. -Tree thinning. -Juniper clearing.	2. Prescribed burns would be conducted to improve understory vegetation and remove excess duff. Pastures may be burned to release nutrients. Piles of slash resulting from juniper clearing and timber thinning projects may be burned. Appropriate safety and regulatory actions would be undertaken prior to burning. Timber thinning & juniper removal projects would take place using hand & mechanical tools (i.e. chainsaws). Heavy machinery may be used to remove cut trees from work site.	2. Burns may result in short term air quality degradation. Removal of duff helps minimize catastrophic fire danger and promotes greater understory diversity. Thinning & juniper projects would result in short term disturbances during project implementation, from noise and dust. Some trailing and compaction to soils would result, but would be minimized by following appropriate S & G's. Thinning of timber would result in more open forests improving wildlife habitat. Juniper projects would help restrict spread of this highly water-consumptive species, improving hydrologic regime and vegetation diversity of work areas.
3. Native plant establishment/ diversification.	3. Replanting of native trees, shrubs, forbs & grasses may be conducted in previously disturbed sites. Seeding, transplants, & cuttings may be utilized.	3. Short-term distubance and compaction to soil may result from project activities. Replanting would improve water retention, minimize soil movement, and stabilize slopes.
4. Non-native plant removal/control.	4. See Riparian #3.	4. See Riparian #3.

5. Fencing for livestock control. 6. Alternative watering sources for livestock.	5 & 6. Installation of fences and watering facilities in upland habitats would be comparable to riparian/wetland installations (see Riparian #1), except watering facilities may be ground water drawn.	5 & 6. Construction of fences and alternative watering sources may cause temporary decreases in water quality and may impact upland vegetation. However, native vegetative and stabilization techniques would eliminate or reduce these conditions. Limiting or excluding livestock from unstable soils and slopes and encouraging cross-pasture movement would provide protection from future sedimentation and erosion hazards, and would promote an increase in the composition and diversity of native vegetation.
7. Landslide treatments/erosion control.	7. Natural stabilization materials (e.g., vegetation, boulders, rip-rap, woody debris, and fiber matting) would be installed to retain slope and allow native vegetation to become re-established. Slide slopes may be graded back to a n appropriate slope ratio to eliminate or reduce erosion and to ensure that structures and techniques would function properly. Structures would be placed and appropriately anchored along the toe of the slide.	7. Installation of erosion control structures may cause temporary decreases in water quality (sedimentation and turbidity) and may impact remaining vegetation within slide area. Stabilizing slides and slopes would reduce influx of sediment into adjacent streams.
8. Wildlife habitat improvements	8. See Riparian #7.	8. See Riparian #7.
Road Projects 1. Road abandonment, decommissioning, & obliteration. 2. Road drainage improvements & storm proofing.	1. To eliminate or reduce sedimentation and erosion hazards to down slope habitats, selected roads would be altered to prevent vehicular use and to stabilize soils, slopes, and roadbeds. Roads may be gated, tanked, removed, planted with native vegetation, or modified through other road related activities. 2. Water drainage patterns on roadways would be modified, as needed, to eliminate or reduce sedimentation and erosion hazards to down slope habitats. Drainage improvements may consist of water bars, road culvert alterations/removals, cross drain installations, revegetation of fill and cut slopes, sidecast removals, road prism shaping, or other road related activities. Road surfaces may be hardened (i.e. storm proofed) to prevent road material washing off roadbeds and moving into streambeds.	1 & 2. Depending on the type of road related activities, the above installations or modifications may cause temporary decreases in down slope water quality and would impact riparian/wetland or upland vegetation in the immediate area around the work site. Follow-up native vegetative plantings and stabilization structures/ techniques would eliminate or reduce these conditions. Excess fill materials removed during the completion of the above activities would be deposited in appropriate upland areas and stabilized to eliminate future sediment loading in down slope habitats.

3. Culvert/stream crossing upgrades.	3. Culverts and stream crossings may be modified to improve fish passage and water quality. Culverts may be removed as part of road decommissioning projects. External and internal culvert alterations may include the installation of baffles to redirect or reduce flow velocities, step-and-pool weirs at culvert outlets, trash/debris racks, or erosion protection structures at culvert outlets or inlets. Misaligned and inappropriately placed culverts would be excavated and realigned, and the necessary fill materials & roadways replaced. Culverts determined to be undersized, with respect to current hydrologic flows, would be replaced with appropriately sized culverts. Dynamic changes in stream flow patterns through culverts have caused streambank erosion, undermining of roadbeds, and the washout of culverts. Redesigning culverts to current stream flows would eliminate or reduce these conditions. The areas around culvert removal sites would be contoured to surrounding slope conditions and stabilized by appropriate means. Stream crossings determined to be inappropriate for current culvert installations may be redesigned or replaced with various bridge installations or hardened fords made of gravel or concrete.	3. Culvert modifications and removal, and stream crossings improvements may result in temporary increases in sediment loading and loss of riparian/wetland vegetation. Follow-up native vegetative plantings and bank stabilization structures/techniques would eliminate or reduce these conditions. Excess fill materials removed during the completion of the above activities would be deposited in appropriate upland areas and stabilized to eliminate future sediment loading in down slope habitats. Overall, these modifications would provide extended benefits to fish species by improving passage, aquatic habitats, and water quality.